

AFS Climate Change Outreach (General Public and Profession)

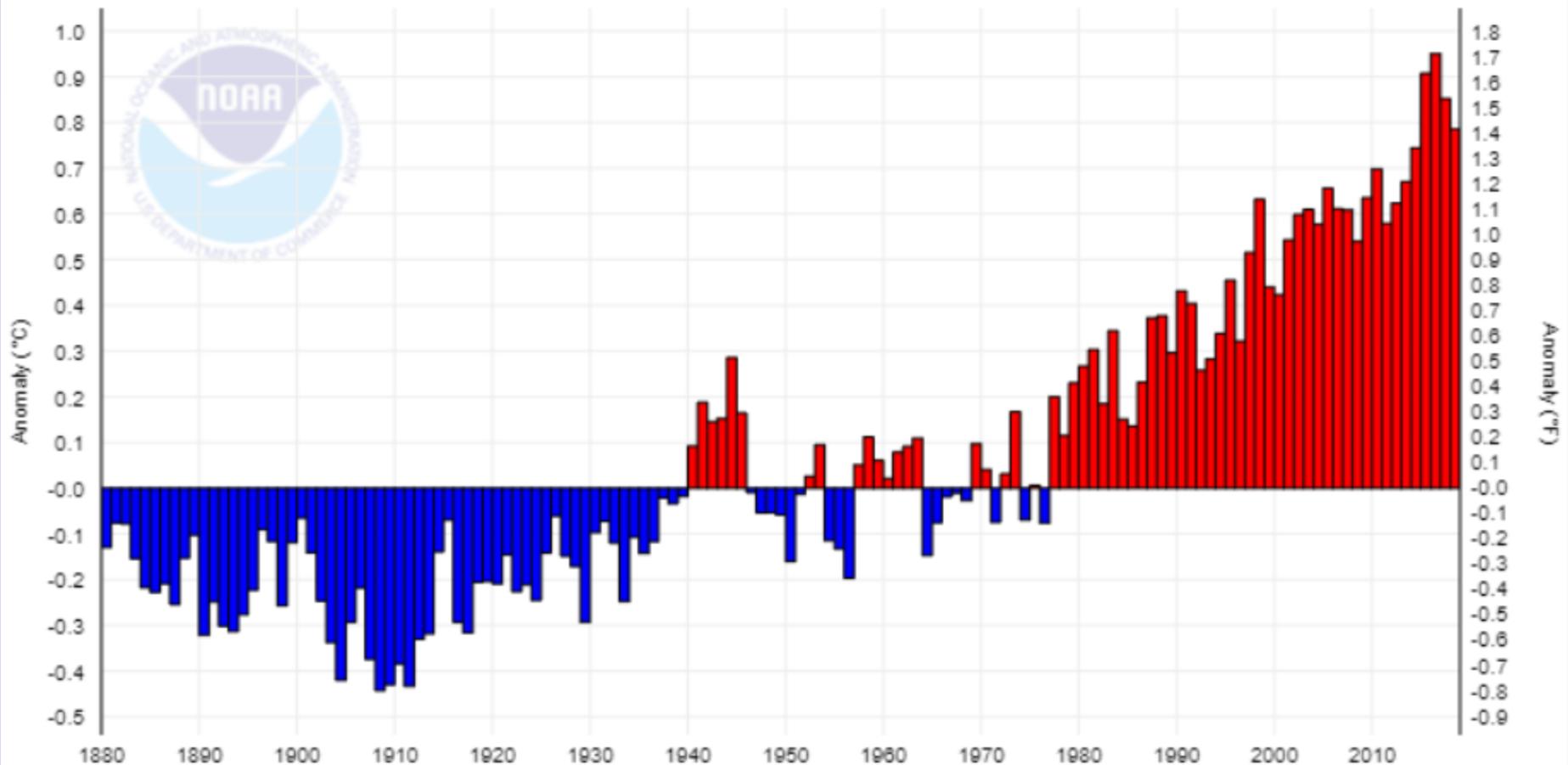


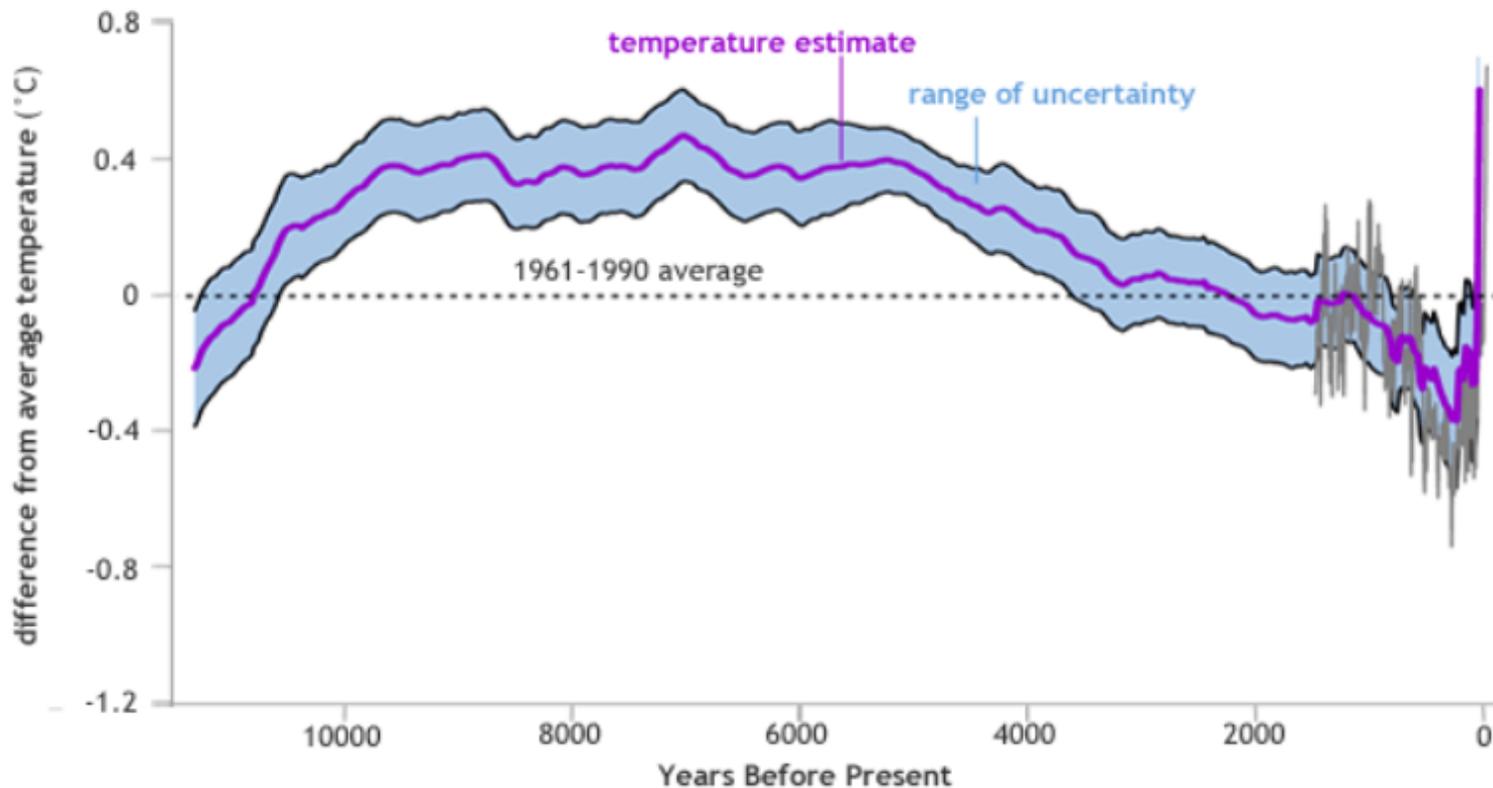
Joint Statement of AFS/TWS

- *“If we are to safeguard our own wellbeing as a species, it is imperative that the scientific underpinnings of fish and wildlife conservation and management are heard and used to find solutions.”*

Peer Reviewed Data and Studies

Global Land and Ocean Temperature Anomalies, January-December





Global temperature anomalies over the past 11,300 years compared to historic average (1961-1990). The purple line shows the annual anomaly, and the light blue band shows the statistical uncertainty (one standard deviation). The gray line shows temperature from a separate analysis spanning the past 1,500 years. Image adapted from Figure 1(b) in Marcott et al.

Marcott, S. A., J. D. Shakun, P. U. Clark, and A. Mix. 2013. A Reconstruction of Regional and Global Temperature for the Past 11,300 Years. *Science* 339(1198).

nature

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NATURE | NEWS



Global temperatures are close to 11,000-year peak

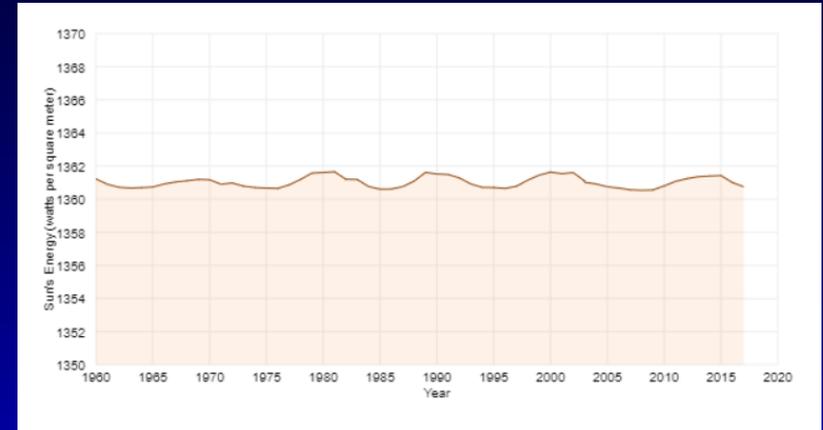
Planet is set to get hotter than at any time since last ice age by end of century.

Sid Perkins

07 March 2013

What is related to current climate change?

Not incoming energy
from the sun...



From NOAA website (<https://www.climate.gov/news-features/understanding-climate/climate-change-incoming-sunlight>) Data courtesy of Greg Kopp, Laboratory for Atmospheric and Space Physics, University of Colorado; and Judith Lean, Space Science Division, Naval Research Laboratory.

Not volcanic activity...

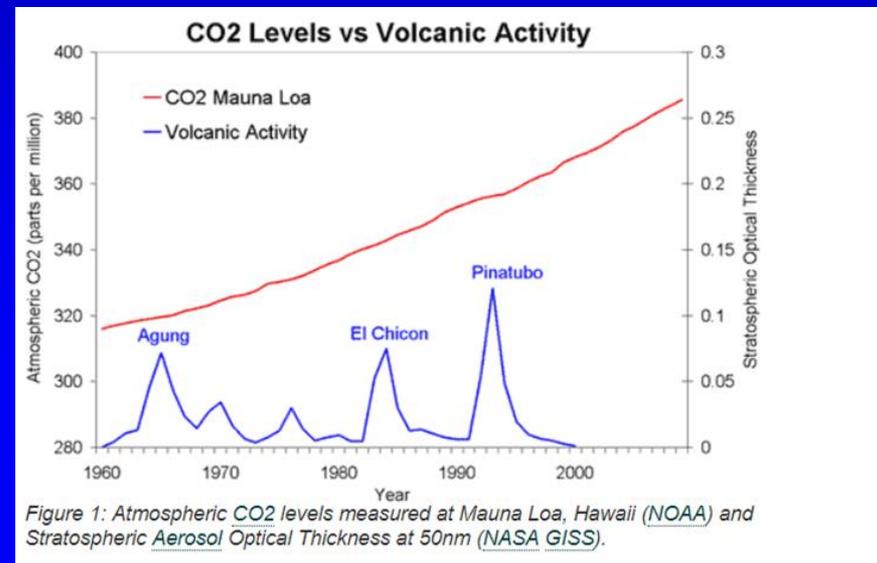
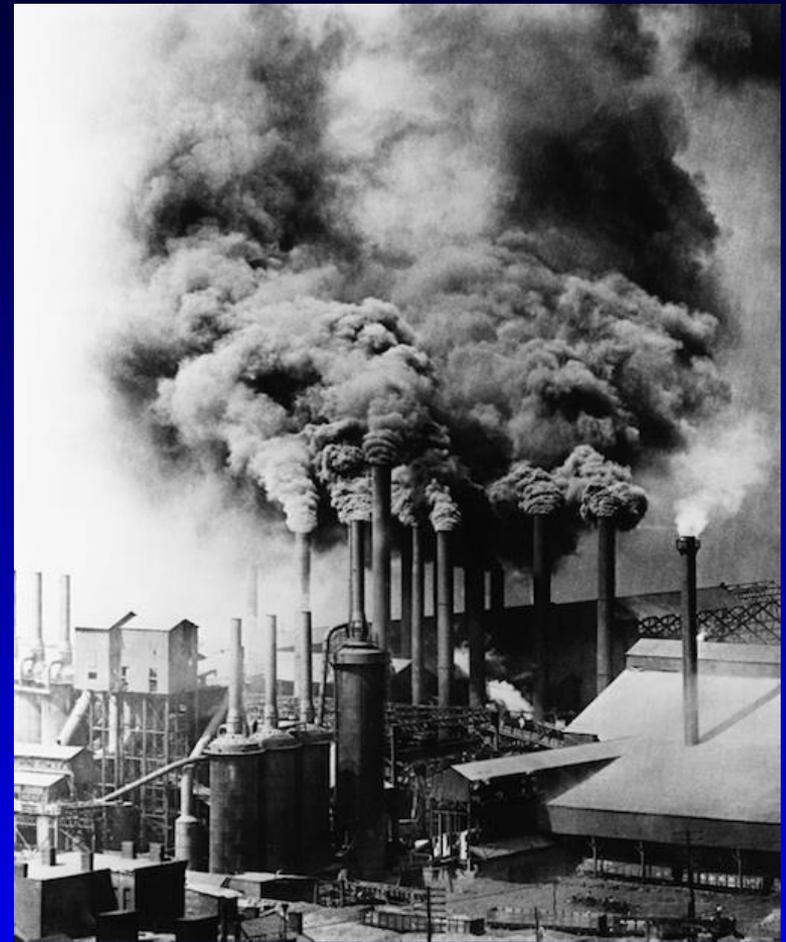
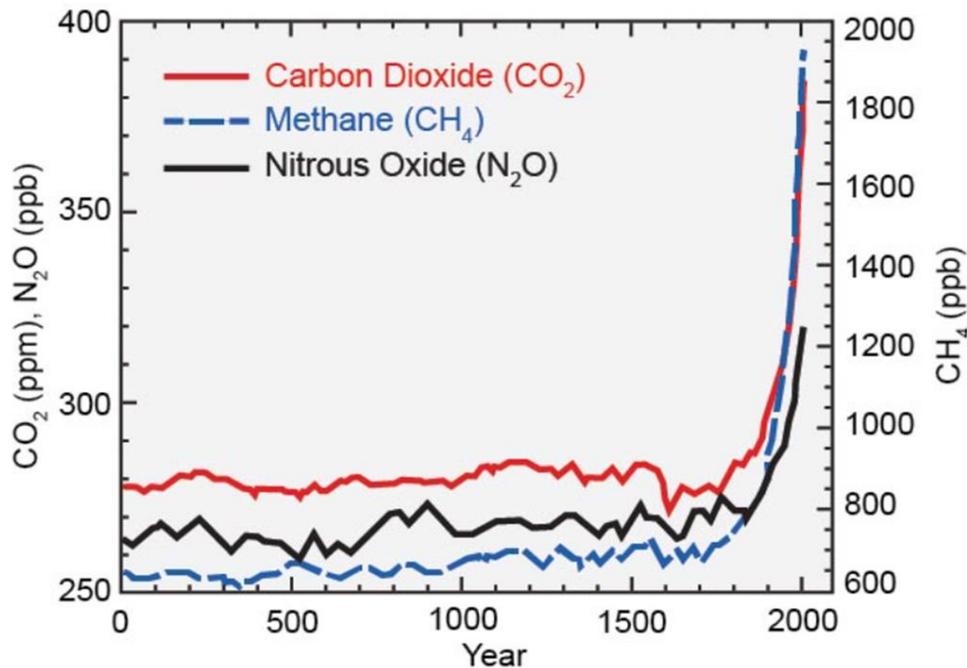


Figure 1: Atmospheric CO₂ levels measured at Mauna Loa, Hawaii (NOAA) and Stratospheric Aerosol Optical Thickness at 50nm (NASA GISS).

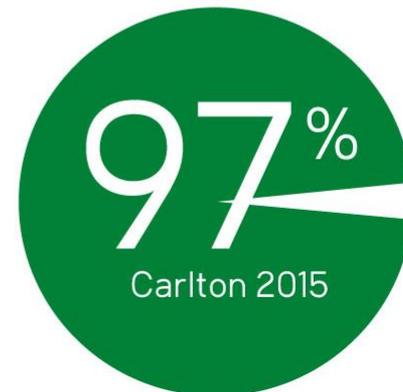
It's human emissions of greenhouse gasses!



Climate Change 2007: The Physical Science Basis.
Contribution of Working Group I to the Fourth Assessment
Report (AR4) of the Intergovernmental Panel on Climate
Change

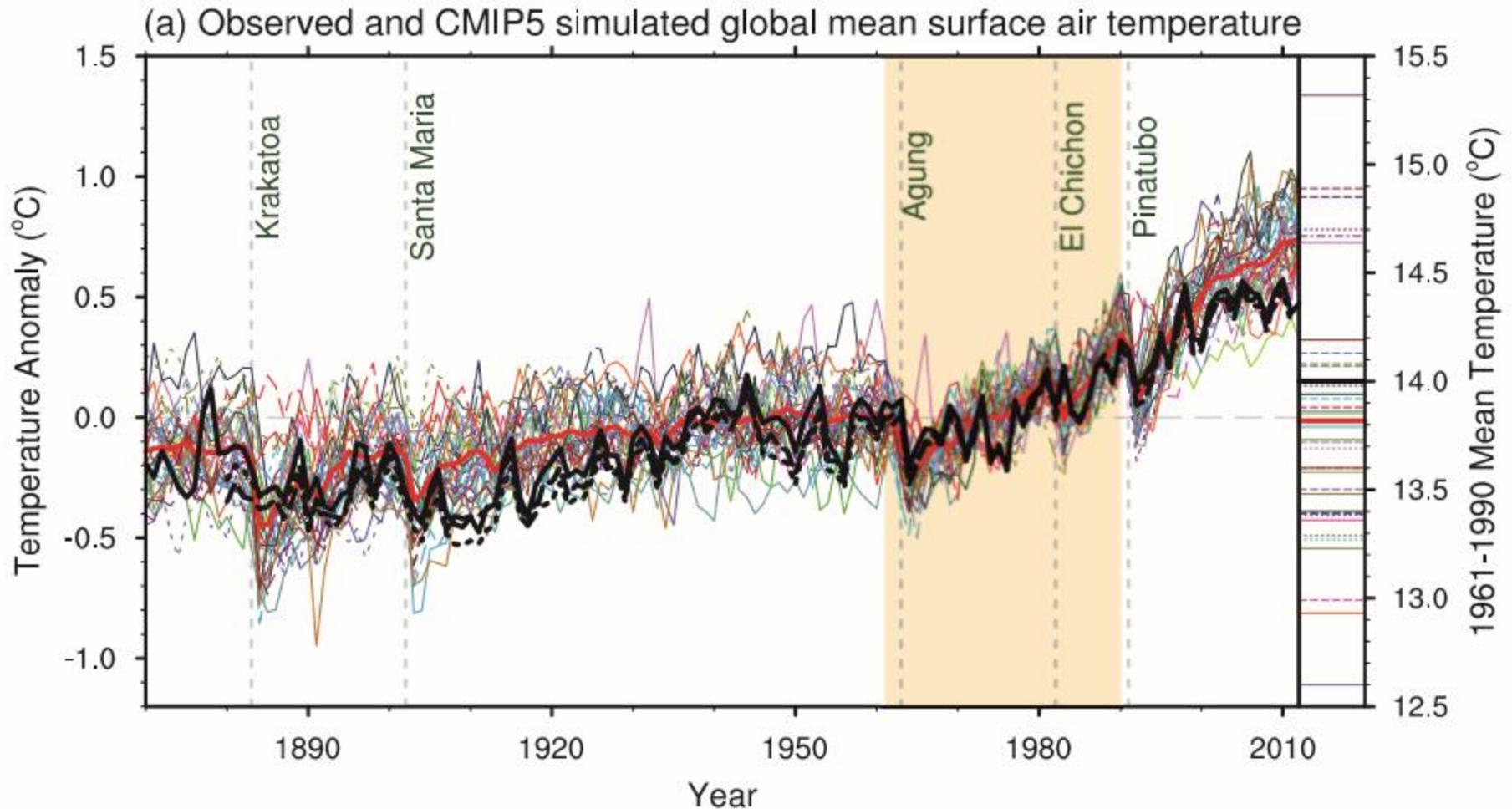
Billions of tons of CO₂
pumped into atmosphere
since industrial revolution

Overwhelming consensus of climate scientists who have published peer-reviewed climate research, or peer-reviewed climate papers that human-caused climate change is occurring.

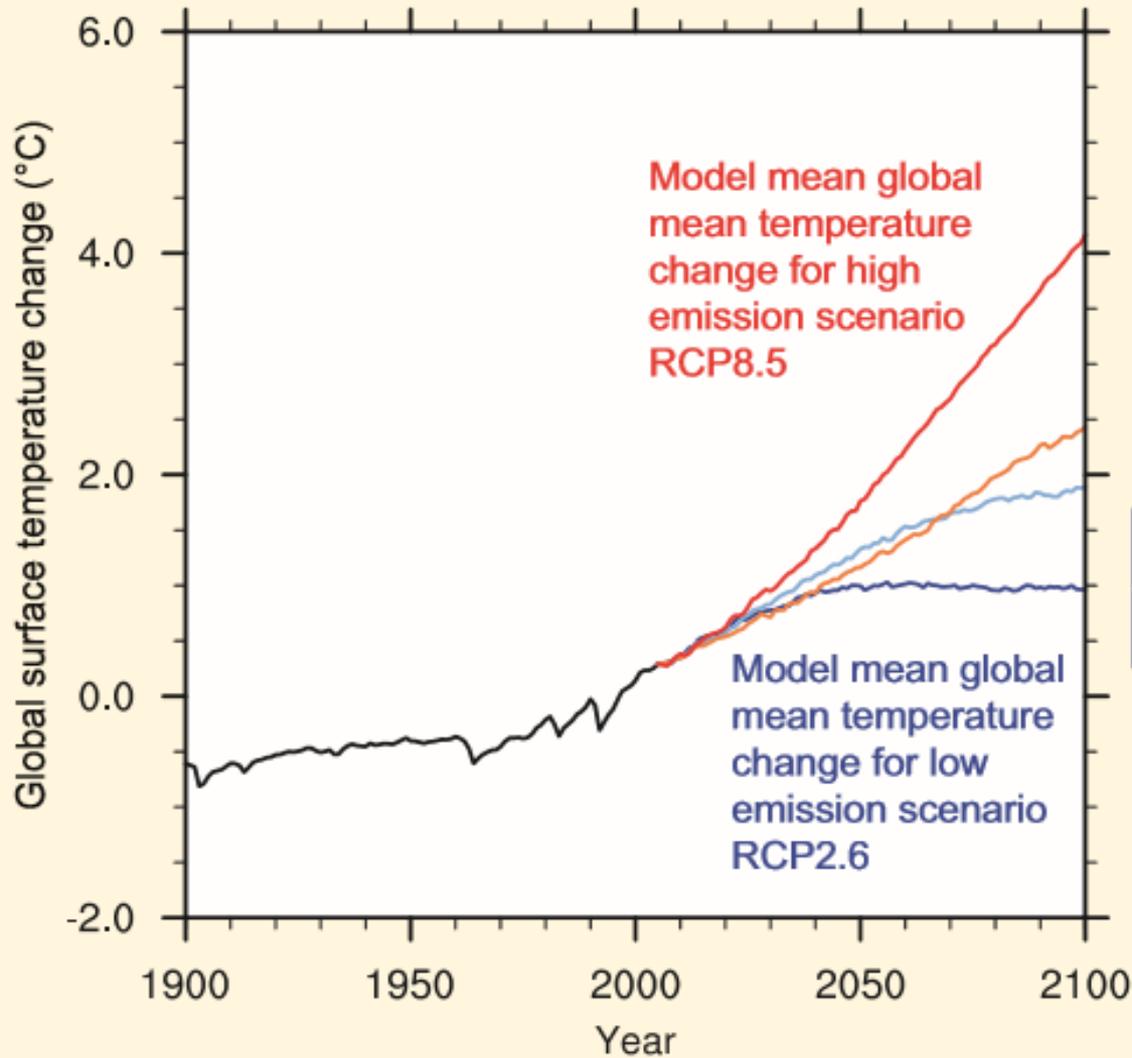


John Cook et al. 2016. Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. *Environ. Res. Lett.* 11 048002

Models fit historic data well



...and predict a dire future unless emissions reduced



Is a 1.5-5.5°C (2.7-9.9°F) change to global temperature a lot?



Global mean surface temperature was 4-9°C (7-16°F) colder in last ice age...

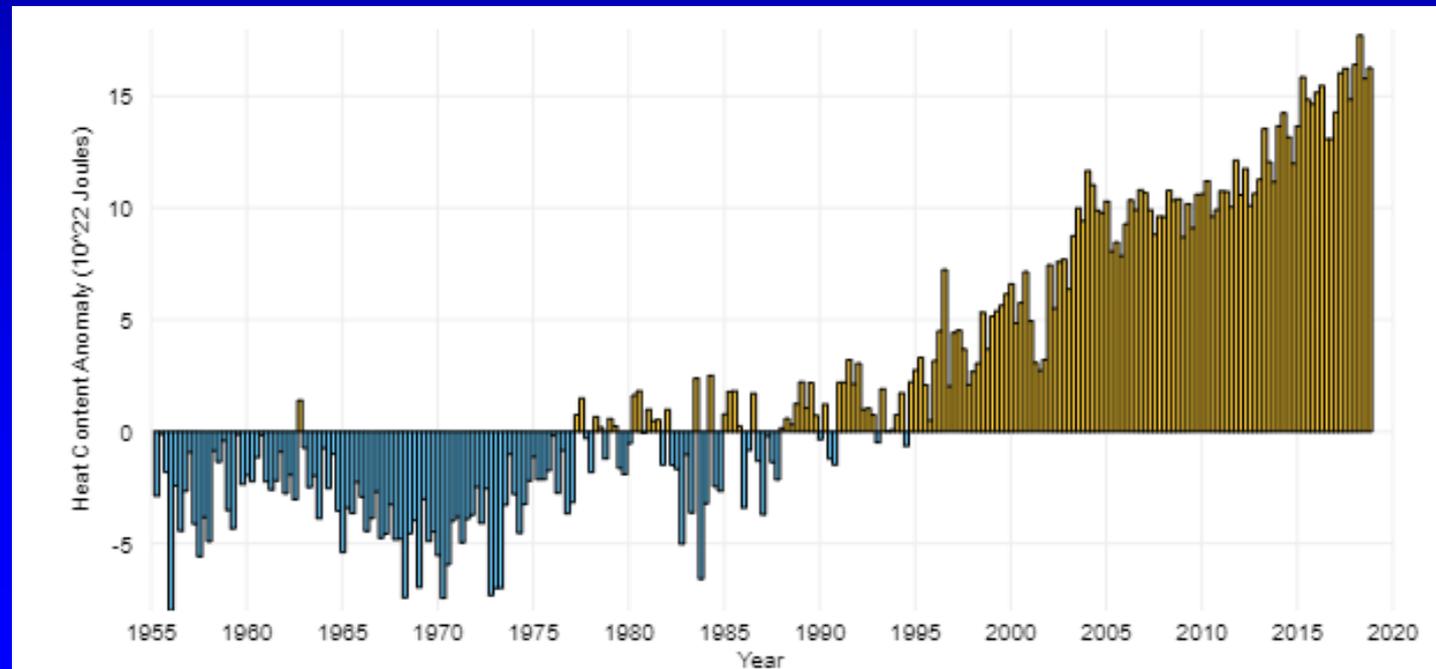
...Once committed, there is no going back

>90% of warming in the last 50 years has occurred in ocean

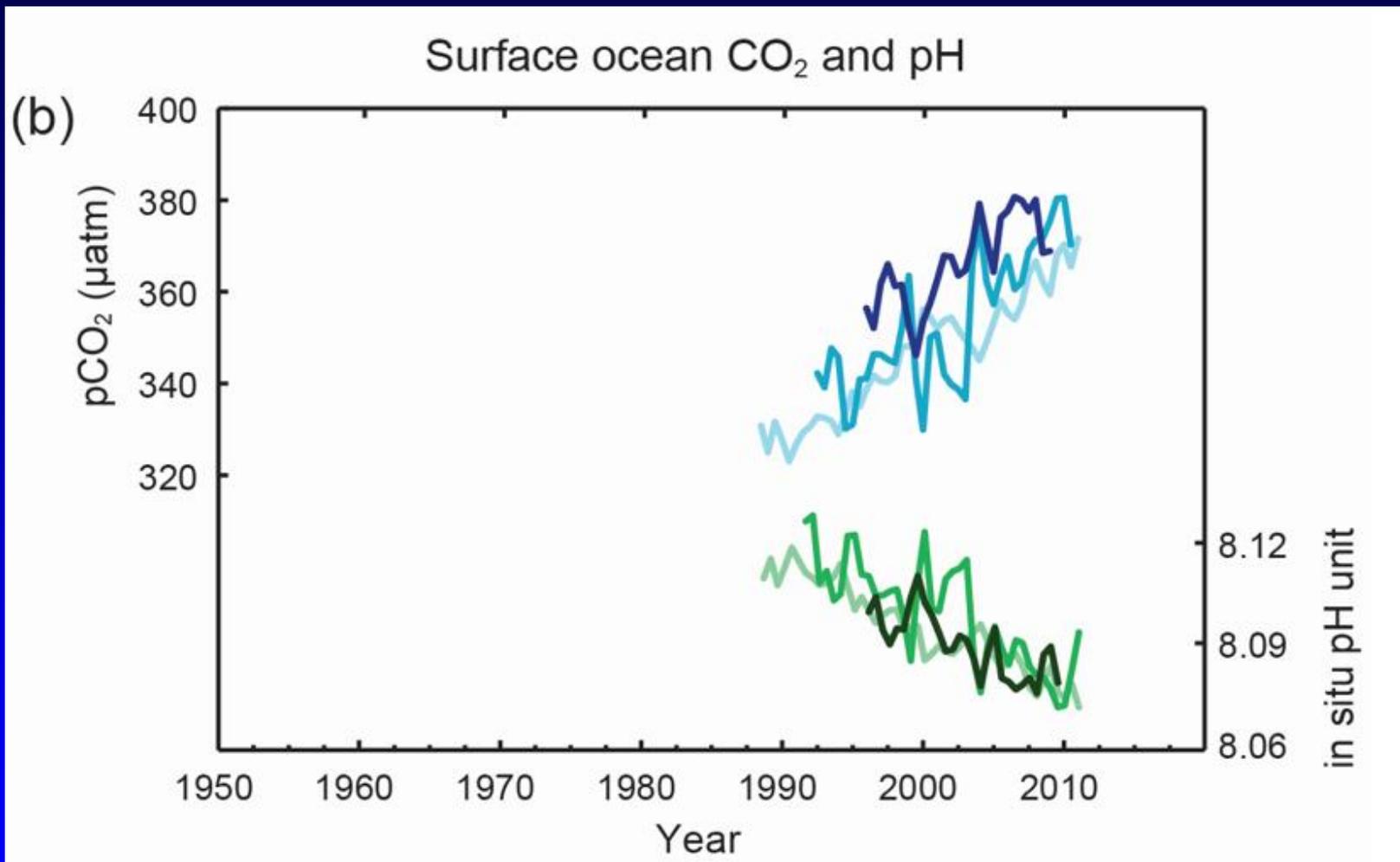
Heat stored in ocean eventually released, committing earth to additional warming in future



From NOAA,
<https://www.climate.gov/news-features/understanding-climate/climate-change-ocean-heat-content>



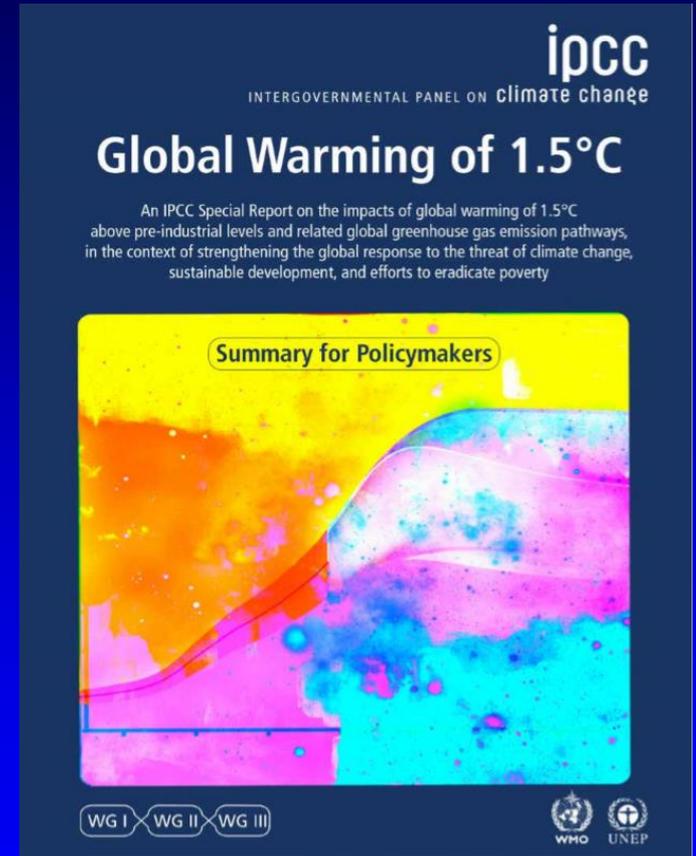
Added CO₂ also increases ocean acidity



IPCC, 2013: Climate Change
2013: The Physical Science
Basis.

What to do?

- “Avoiding overshoot (of 1.5°C) and reliance on future large-scale deployment of carbon dioxide removal (CDR) can only be achieved if global CO2 emissions start to decline well before 2030.”¹



IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C.

¹underline and bold added.